

TOSHIBA FIELD EFFECT TRANSISTOR  
GaAs N CHANNEL SINGLE GATE MODULATION DOPE TYPE**2SK2496**

SHF BAND LOW NOISE AMPLIFIER APPLICATIONS

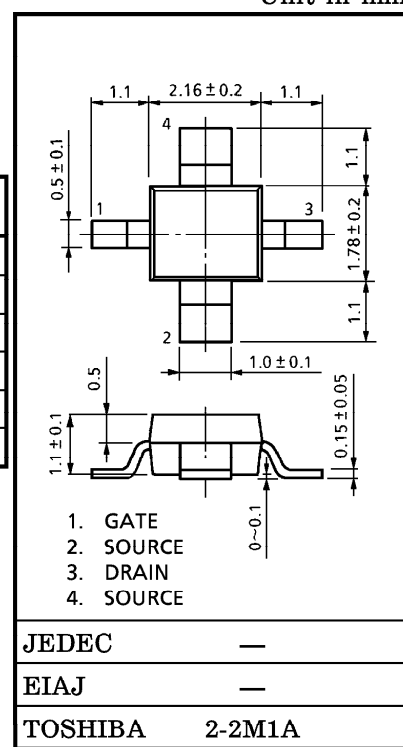
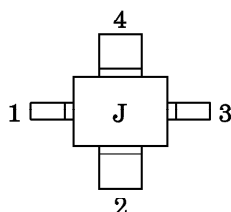
Unit in mm

- Low Noise Figure : NF=0.9dB (f=12GHz)
- High Gain : Ga=11dB (f=12GHz)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Gate-Drain Voltage	V <sub>GDO</sub>	-3	V
Gate-Source Voltage	V <sub>GSO</sub>	-3	V
Drain Current	I <sub>D</sub>	80	mA
Power Dissipation	P <sub>D</sub>	150	mW
Channel Temperature	T <sub>ch</sub>	125	°C
Storage Temperature Range	T <sub>stg</sub>	-55~125	°C

Marking



Weight : 0.016g (Typ.)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0, V <sub>GS</sub> =-2V	—	—	-20	μA
Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =2V, V <sub>GS</sub> =0	20	40	80	mA
Gate-Source Cut-off Voltage	V <sub>GS</sub> (OFF)	V <sub>DS</sub> =2V, I <sub>D</sub> =100μA	-0.2	-0.8	-2	V
Forward Transfer Admittance	Y <sub>fs</sub>	V <sub>DS</sub> =2V, I <sub>D</sub> =15mA, f=1kHz	—	80	—	mS
Noise Figure	NF	V <sub>DS</sub> =2V, I <sub>D</sub> =15mA, f=12GHz	—	0.9	1.2	dB
Associated Gain	Ga	V <sub>DS</sub> =2V, I <sub>D</sub> =15mA, f=12GHz	10	11	—	dB

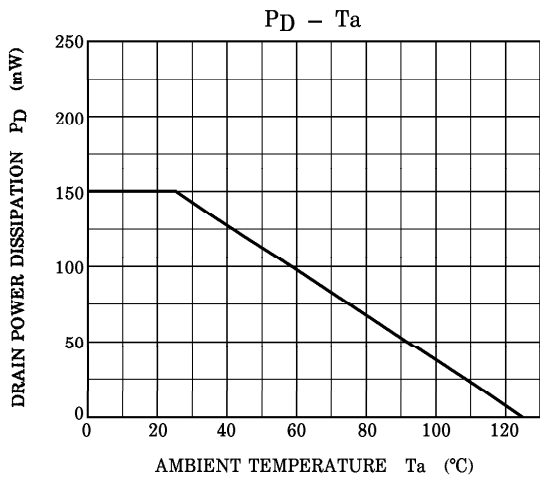
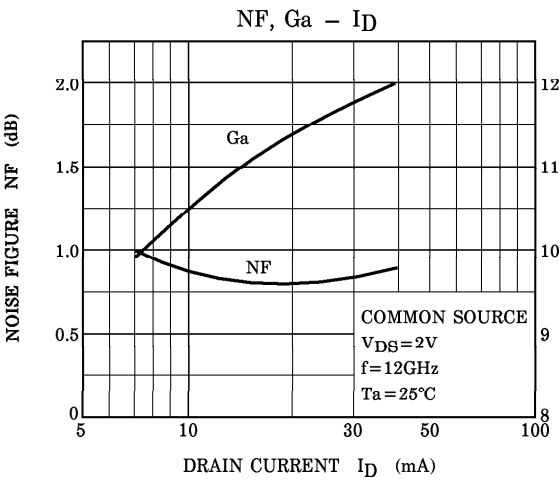
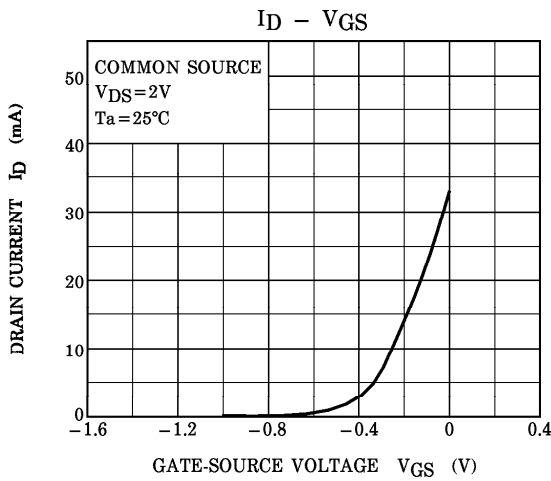
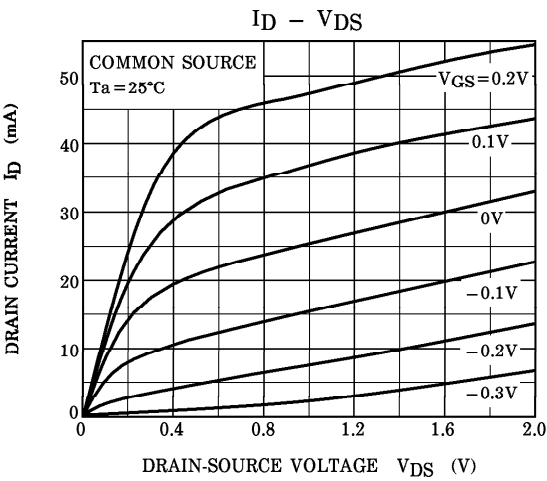
## CAUTION

GaAs (Gallium Arsenide) is used in this product. The dust or vapor can be dangerous to humans. Do not break, cut, crush or dissolve chemically. Dispose of this product properly according to law. Do not intermingle with normal industrial or domestic waste.

This device electrostatic sensitivity. Please handle with caution.

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- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
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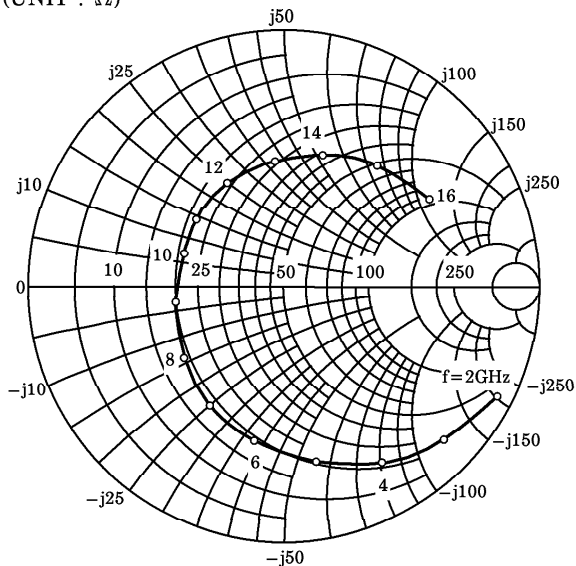
## S-PARAMETER

## COMMON SOURCE

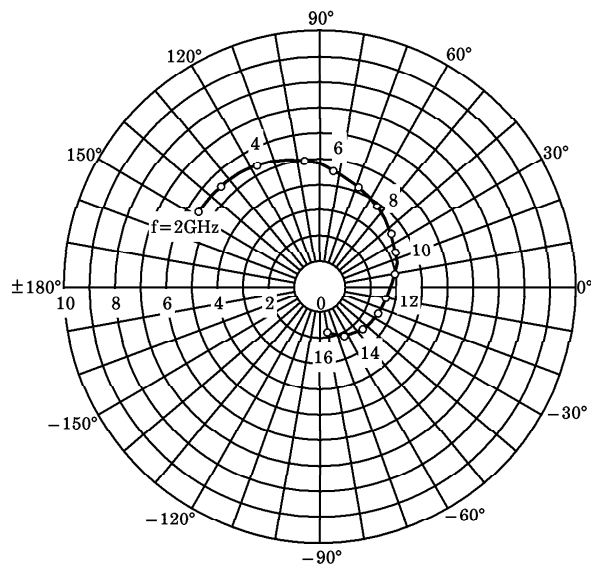
(V<sub>DS</sub>=2V, I<sub>D</sub>=15mA, T<sub>a</sub>=25°C, Z<sub>0</sub>=50Ω)

FREQ. (MHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2000	0.934	−27	5.446	148	0.040	76	0.381	−15
3000	0.867	−43	5.286	134	0.058	70	0.345	−27
4000	0.791	−60	5.123	117	0.076	58	0.298	−38
5000	0.704	−80	4.897	97	0.096	47	0.231	−53
6000	0.616	−101	4.578	83	0.108	38	0.162	−73
7000	0.544	−122	4.201	68	0.120	27	0.117	−95
8000	0.477	−144	3.843	53	0.127	17	0.075	−126
9000	0.422	−172	3.510	36	0.132	3	0.066	148
10000	0.415	162	3.228	22	0.139	−5	0.124	114
11000	0.433	142	3.038	9	0.144	−15	0.169	100
12000	0.458	117	2.805	−10	0.151	−29	0.225	80
13000	0.493	95	2.606	−25	0.151	−41	0.284	64
14000	0.539	74	2.430	−44	0.153	−56	0.331	51
15000	0.605	51	2.174	−64	0.154	−73	0.417	33
16000	0.670	30	1.837	−80	0.140	−86	0.505	17

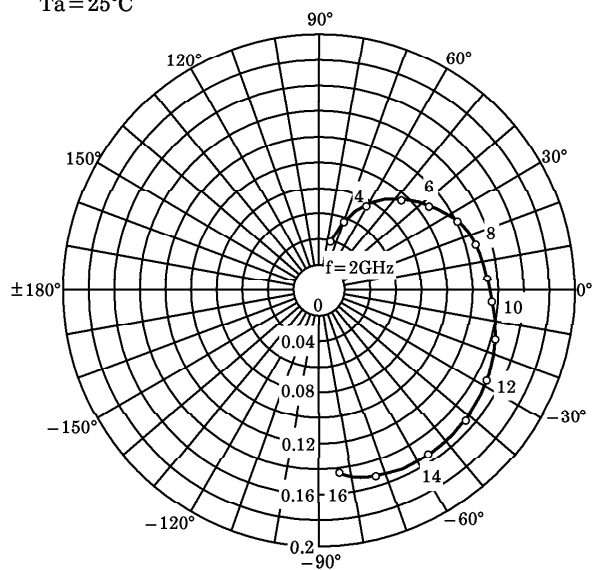
S<sub>11</sub>  
COMMON SOURCE  
V<sub>DS</sub>=2V  
I<sub>D</sub>=15mA  
T<sub>a</sub>=25°C  
(UNIT : Ω)



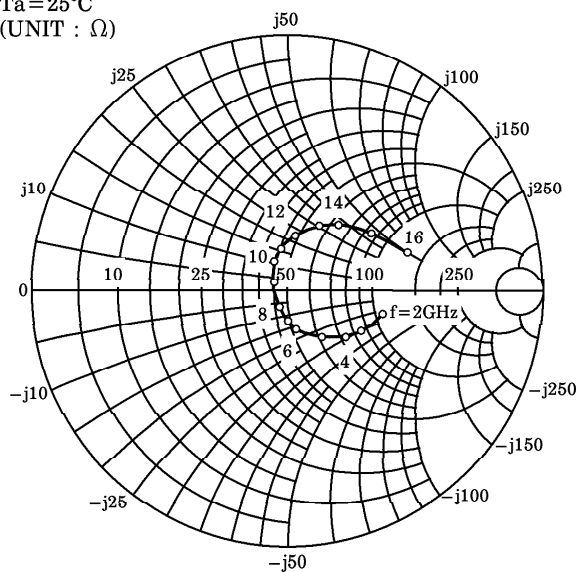
S<sub>21</sub>  
COMMON SOURCE  
V<sub>DS</sub>=2V  
I<sub>D</sub>=15mA  
T<sub>a</sub>=25°C



S<sub>12</sub>  
COMMON SOURCE  
V<sub>DS</sub>=2V  
I<sub>D</sub>=15mA  
T<sub>a</sub>=25°C



S<sub>22</sub>  
COMMON SOURCE  
V<sub>DS</sub>=2V  
I<sub>D</sub>=15mA  
T<sub>a</sub>=25°C  
(UNIT : Ω)

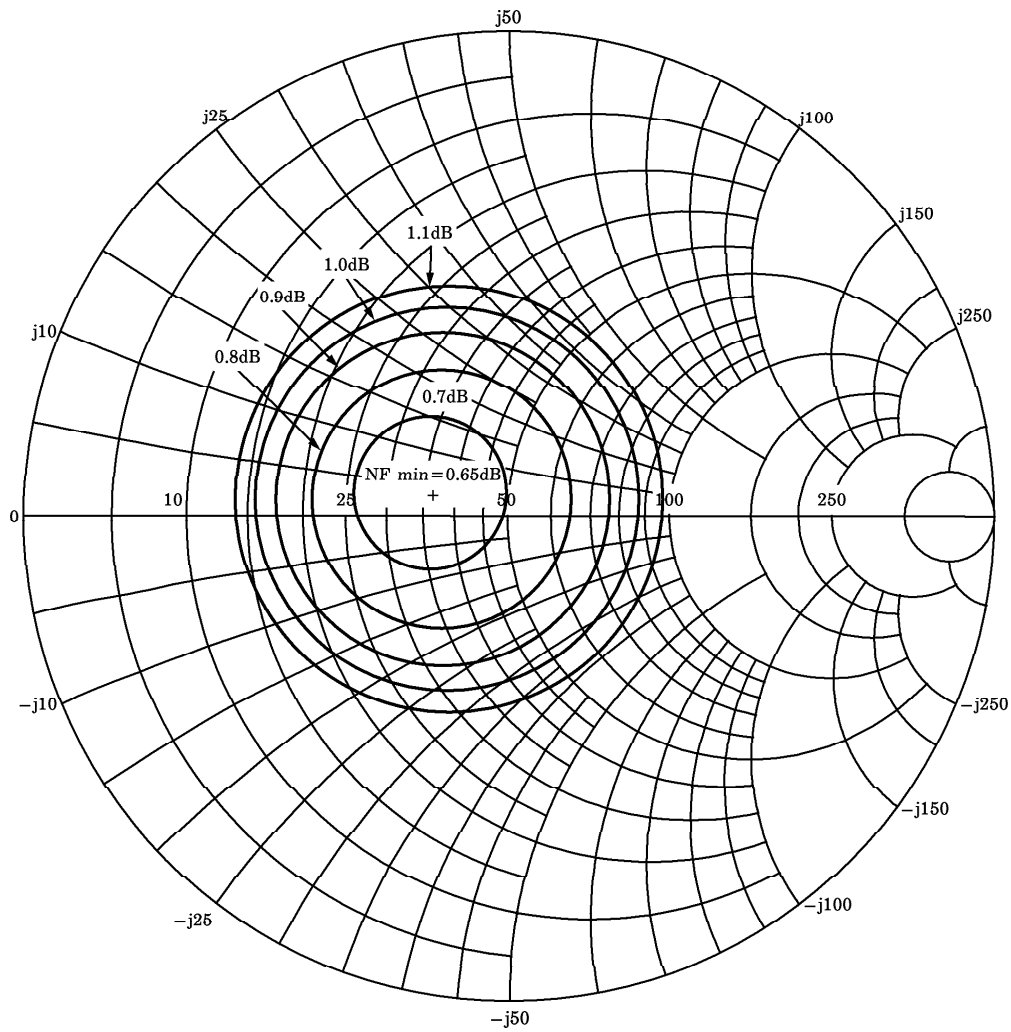


## CONSTANT NOISE FIGURE

NF min = 0.65dB,  $\Gamma_{\text{opt}} = 0.16 \angle 164^\circ$ ,  $R_n = 4.7\Omega$

@  $V_{\text{DS}} = 2\text{V}$ ,  $I_{\text{D}} = 15\text{mA}$ ,  $f = 12\text{GHz}$

$T_a = 25^\circ\text{C}$ ,  $Z_0 = 50\Omega$



## Recommended Methods of Mounting for This Device

Mounting method				
Solder flow	Nearinfrared reflow	Farinfrared reflow	VPS & hot air reflow	Soldering iron
×	○	◎	◎	○

◎ : Applicable

○ : Applicable only once

×

× : Not applicable; other methods are recommended.

Note 1 : For either method of mounting, the above table shows whether applicable or not under Toshiba's recommended mounting conditions.

Note 2 : When mounted a number of times, those marked by ◎ can only be used. In this case, mounting is allowed up to three times, with the interval from the first to the third mounting completed within 24 hours.